tion. For in place of instructing the angler in the art of alluring river-fish of all kinds, this volume, as, indeed, is indicated in its supplementary title, tells him only how to capture the wily trout. Since, however, this is, *par excellence*, the sporting fish of English rivers, there may be some justification for the designation. The author has already published a more ambitious work on trout-fishing, which has, we believe, been well received by anglers; but that volume is intended mainly for the benefit of those who are already experts in the gentle art, whereas in the one now before us it is sought to instruct the beginner in the elementary principles of trout-fishing.

Mr. Hodgson is evidently one of those who believe that salvation is to be found otherwise than by "dry-fly" fishing; and a considerable portion of his work is accordingly devoted to other methods, inclusive of spinning with minnows, and luring with the luscious wasp-grub. That the author will not please every angler in all details may be regarded as a matter of course; but, speaking generally, he seems to have treated his subject in a manner which ought to satisfy those who are making their first essays at trout-fishing. The book is well illustrated, and likewise contains a number of observations on the natural history of the subject, and, indeed, on nature-study generally. R. L.

GENETICS.[1]

THE last contribution to the fast-increasing pile of Mendelian literature is unique. It is at once the bulkiest, within the limits of two covers, that has been made to this subject, and at the same time the most condensed, the most varied, and the most valuable.

The third International Conference on Genetics, held under the auspices of the Royal Horticultural Society, and under the presidency of Mr. Bateson, was a veritable Mendelian orgie. The history of all new theories is the same. They are judged not so much on their own merits as on the number and variety of natural processes, previously unintelligible, which they explain. The result of the publication of the "Origin of Species" was, as Mr. Bateson has pointed out, the distraction of the attention of biologists from the process of evolution itself and its diversion into the hitherto dry channels of palæontology, classification, embryology, comparative anatomy, and distribution. It was not until the end of the nineteenth century that men returned to the study of evolution. The relation between man and a new theory is the same as that between a child and a new toy. When we first get the toy we are occupied in playing with it in every possible way, and as often and as much as we can. But when all legitimate sources of interest have been tapped, we tire of playing with the toy and begin to wonder how it works; and, to satisfy our curiosity, we pull it to pieces. The result of the attempt to satisfy this curiosity in the case of Darwin's theory was the growth of a conviction that natural selection did not provide a sufficient explanation of the diversity of organic forms. The history of Mendelism has been like that of Darwinism. The flood of energy let loose by the re-discovery of Mendel's papers has spent itself rather in work based on the assumption that the interpretation which Mendel put on the facts he discovered was true than in the attempt to discover whether that interpretation were true or not; and in our opinion it is right that this should be so. The merely critical spirit is a barren one. The enthusiasm of the kind which follows the birth of a new theory such as Darwin's or Mendel's has been as productive of discovery in the case of the latter as it was in that of the former. At the same time, we should not forget that Mendelism is now in the stage in which Darwinism was before it was subjected to the process of being overhauled; and though we may perhaps be right in holding that criticism is barren of discovery, we should guard against the possibility of entering that frame of mind which regards criticism as blasphemy. Mendel's peas have already been called classical; and it is a very remarkable fact that no one has repeated Mendel's experiments with the deliberate intention of testing the Mendelian interpretation of the results. People speak as if Mendel got to the bottom of the inheritance of roundness and wrinkledness, yellowness and greenness, and as if there was nothing more to be said on the subject. On p. 88 of the report before us there is a table exhibiting the result of crossing a yellow with a green pea to the fifth generation. The proportion of pure yellows, impure yellows and greens is given both for the fourth and for the fifth generation as 1 : 2 : 1, and it is stated on the bottom of p. 88 that this process of segregation will be continued "practically for ever." It is highly probable that the three categories do form respectively 25, 50, and 25 per cent. of generations four and five; but Mendel never published any figures which prove this to be so. All he said was: "The proportions in which the descendants of the hybrids develop and split up in the first and second generations presumably hold good for all subsequent progeny. Experiments one and two have already been carried through six generations, three and seven through five, and four, five, and six through four, these experiments being continued from the third generation with a small number of plants, and no departure from the rule has been perceptible."[1]

We offer no apology for adopting this critical attitude towards Mendelism. There is plenty of admiration for "Mendel's incomparable achievement," and we share it; but we do not find it impossible to combine it with a suspicion that Mendel's interpretation of his results may not have been right after all.

The report is, of course, absolutely indispensable to every student of genetics, whether his interest is purely scientific or purely horticultural, or both. The keynote of the conference was struck by a pealing of the marriage bells of Science and Practice. We could have no better guarantee that their union will be fertile than that their hands were joined by the Rev. W. Wilks, who has earned the gratitude of every study of heredity by editing this report, and of every lover of flowers by creating the Shirley poppy.

[1] Report of the Third International Conference, 1906, on Genetics. Edited by Rev. W. Wilks. Pp 486. (Printed for the Royal Horticultural Society by Spottiswoode and Co., Ltd., n.d.) Price 15*s*.

[1] This is Bateson's translation, Mendel's "Principles," p. 57. The original may be consulted, most accessibly, at p. 16 of No. 121 of Ostwald's *Klassiker der exakten Wissenschaften*, Versuche über Pflanzenhybriden Price 1 mark.

NOTES.

PROF. H. LE CHATELIER has been officially nominated professor of chemistry at the Paris Faculty of Sciences in succession to the late Prof. Henri Moissan.

IT has been decided by the Paris Municipal Council to perpetuate the memory of Prof. Berthelot by re-naming the Place du Collége de France the Place Marcelin Berthelot.

WE regret to have to record that Prof. Karl Vogel, director of the Astrophysical Observatory at Potsdam, died on August 13.

WE regret to have to announce the death of the Rev. Dr. John Kerr, F.R.S., formerly lecturer on mathematics in the Glasgow Free Church Training College.

THE death, from heart failure, of Sir William Robertson Copland took place at Glasgow on Monday last. Sir William Copland made a special study of drainage and of water supply, and took great interest in promoting technical and university education, being chairman of the governing body of the Glasgow and West of Scotland Technical College, and a member of the Glasgow University Court. He was knighted last year.

DR. WILLIAM THOMSON, who died at Philadelphia on August 3 at the age of seventy-four, had not only written largely on medical and surgical subjects, but had introduced several reforms in field service. At the battle of Antietam, in the American Civil War, he abandoned the old practice of bringing all the wounded into one hospital, and improvised a number of smaller hospitals in various parts of the field. The success of this innovation led to its adoption during the rest of the war, and later in the Franco-German War. Dr. Thomson will be further remembered for adopting the local application of carbolic acid as a disinfectant in the treatment of wounds, and for the introduction, in connection with the Pennsylvania Railroad, of the testing of engine-drivers for colour-blindness.

A REUTER telegram states that the instruments of the chief seismographical station at Hamburg registered several earthquake shocks in the afternoon of Saturday last. Slight shocks were recorded at about 1.22 p.m. and shortly after 2 p.m., while at 6.40 p.m. the instruments began to record a series of distant shocks of medium strength, which lasted nearly two hours. The disturbance reached its height shortly before 7 p.m., and ceased at about 8.45 p.m. It is estimated that the earthquake occurred at a spot 8000 kilometres south-east of Hamburg; a seismic shock was also recorded at Grenoble at 5h. 43m. 40s. on the same day.

IT is announced in *Science* that the yearly sum of 5000 dollars has been voted by the Minnesota Legislature towards the maintenance of a Pasteur institute at Minneapolis.

A CIRCULAR letter has been distributed by the president and general secretaries of the second International Congress on School Hygiene concerning the important new departure made by the congress in the matter of school hygiene. Arising out of the question of whether it would not be advisable to establish a bureau, with a permanent staff, library and museum, &c., in some central but neutral spot, such as a Swiss or Dutch town, it was decided that it would probably lead to greater progress if such bureau was not localised, but if each country had its own centre for the diffusion of knowledge, and to act as a clearing-house in the matter of school hygiene, statistics, laws, and regulations. Finally, to supervise in scientific matters and generally to do all that is possible at all times or places to forward the human interests which are bound up in the special lines of knowledge included in school hygiene, the International Committee has formed a small council, consisting of the president of the past congress, the president of the one lately held, the president of the next congress, and nine other members to be elected, which will have all the powers of an ordinary committee. The following questions will come under the consideration of the council almost immediately:—How medical inspection of schools can best be carried out with the maximum of efficiency and minimum of cost; how far the laws of health can best be imparted to the coming generation, so that later they will know how to care for themselves and those dependent on them; the best systems or methods of physical training for both sexes at various ages; and the feeding of children requiring proper nutrition, so that it shall be done without developing pauperism and with regard to those upon whom the cost falls.

IN reply to an inquiry put to him in the House of Commons as to whether, in view of the work already accomplished by the Liverpool School of Tropical Medicine in combating tropical diseases, he could arrange for an increased grant to be made in order that the work might be further extended, the Under Secretary for the Colonies said that a further grant will be made, of which the Secretary of State will be able to specify the amount after consultation with the Treasury.

THE Keith prize (consisting of a gold medal and 50*l.*) has been awarded by the council of the Royal Society, Edinburgh, to Dr. T. H. Bryce for his two papers on "The Histology of the Blood of the Larvæ of *Lepidosiren paradoxa*," published in the Transactions of the society.

THE seventh International Physiological Congress met in Heidelberg last week, with Prof. Kossel as president. About 300 members were present, and 200 communications were made in the four sections into which the congress was divided. At the opening meeting Prof. Kronecker paid a glowing tribute to the late Sir Michael Foster. Prof. Dastre, of Paris, gave a short biography of the late Sir J. Burdon-Sanderson, while Prof. Sherrington spoke of the loss sustained by the congress through the deaths of Prof. Errera, of Brussels, and Prof. A. Herzen, of Lausanne. By order of Grand Duke Friedrich of Baden each member of the congress was given a bronze medal in memory of the meeting. The medal bears on one side an impress of "Helmholtz—MDCCCLVIII–MDCCCLXXI."

THE French Congress of Medicine will be held in Paris under the presidency of Prof. Debove from October 14 to 16. It is proposed to hold discussions on, among other subjects, the question as to the origin of pulmonary tuberculosis; acid-resistant bacilli; the therapeutic action of radium; ionic medication; the use of collargol; the therapeutic value of tuberculin; and the serumtherapy of dysentery and cutaneous sporotrichoses.

THE third International Sanitary Convention is to be held in the city of Mexico from December 2 to 7 next. Each delegate attending is expected to bring a paper relating to the nation represented by him, with a report on the existence of any transmissible diseases—especially bubonic plague, yellow fever, cholera, malaria, beri-beri, and trachoma—that may prevail within its boundaries. Among the questions to be discussed are the transmission of yellow fever, the means to be used in combating the *Stegomyia fasciata*, tuberculosis, and various administrative measures.

THE eighteenth annual general meeting of the Institution of Mining Engineers will take place in the Firth Hall of the University of Sheffield on September 4, when the following papers will be read, or taken as read:—The sinking of Bentley Colliery, by Messrs. J. W. Fryar and Robert Clive; roof-weights in mines, by Mr. H. T. Foster; and deep boring at Barlow, near Selby, by Mr. H. St. John Durnford. A number of visits to collieries, works, &c., have been arranged.

THE recent opening of the medical academy at Düsseldorf was, according to the Berlin correspondent of the *Lancet*, an event of some importance, and was attended with considerable display. The academy and that at

Cologne have a two-fold object. In the first place they import a new feature into medical study by introducing newly qualified men to the practical side of medicine more than is done at the universities. After the university medical curriculum has been completed and the State examination has been passed, the practical year which is required by recent regulations may be spent at the academies. Their second purpose is to supply the medical practitioners of the district with opportunities for post-graduate study. The Düsseldorf Academy is the first for which clinics and lecture-rooms were specially built, because at Cologne the existing municipal hospitals were adapted for teaching purposes. The structural and other arrangements are described as excellent, and the clinical material will be abundant. Prof. Witzel, formerly of the University of Bonn, is the director of the new academy, while the teaching staff includes Prof. Schlossmann in the subject of pædiatrics and Prof. Lubarsch in the subjects of pathology and pathological anatomy.

THE Paris correspondent of the *Chemist and Druggist* states that the committee on analytical methods has defined the programme for the competitions for the prizes offered for alcohol-denaturation in connection with the law of November 29, 1905. This Act instituted two prizes, one of 800*l*. for the discovery of a "denaturator" more advantageous than those now used while safeguarding the revenue against frauds, and a second (value 2000*l*.) for a system of utilising alcohol for lighting in the same manner as paraffin. The denaturator must have a taste and smell which will effectually discourage any desire to use the alcohol as a beverage; wine or date must, oil of thyme and rosemary, and similar flavours are thus eliminated. The denaturant should not be sufficiently objectionable in smell to prevent its domestic or industrial use—thus acetylene, asafetida, and garlic are excluded. No soluble substance which could leave a deposit on lamp-wicks, and thus render combustion difficult, may be used, such as sea-salt, sodium sulphate, alum, ammonium chloride, potassium ferrocyanide, picric acid, tobacco-juice, and aloes. It must not consist of a substance much more or less volatile than alcohol, and which could thus (besides other disadvantages) be removed by fractional distillation, as ether, carbon bisulphide, light fractions of petroleum or turpentine, cresyl, carbolic acid, camphor, or naphthalene. It should contain no substance which might injure the metallic part of lamps or motors (ammonia, nitrobenzene, sulphuric acid). It should not be poisonous (as mercuric chloride, methyl cyanide, sodium arseniate, and aniline) or contain poison (hyoscyamus, aconite, or digitalis). It should be sufficiently inexpensive, should not normally exist in commercial alcohol, and its presence in alcohol should be capable of easy and certain detection.

A PRIZE of 150*l*. is offered by the German Colonial Society for a method to produce an extract from mangrove bark that will impart as light a colour as possible to leather, and such as will only slightly darken by exposure to light. The mangrove bark contains a large amount of tannin, and also a red colouring matter that prevents the bark and its extract from successfully competing with other tanning agents. The problem to be solved is the practical removal of this red colour. Competitors are invited to send in particulars of their methods by July 20, 1908, to Deutsche Kolonialgesellschaft, Schellingstrasse 4, Berlin.

THE Board of Agriculture is considering the terms of an order prohibiting the importation of plants and bushes bearing edible fruit, except by a licence to which conditions will be attached, with the object of preventing the introduction of the gooseberry mildew and other pests injurious to horticulture.

ACCORDING to *Engineering*, an Australian record in wireless telegraphy has been achieved by the successful transmission of messages from H.M.S. *Challenger*, one of the Australian squadron at present stationed in Hobson's Bay, to the flagship *Powerful*, which at the time was moored in Farm Cove, Port Jackson. The *Challenger* was in communication with the flagship by means of wireless telegraphy the whole of her voyage. The longest message was one flashed over a distance of 410 miles in a direct line, and this constitutes an Australian record, as previously never more than 240 miles had been achieved by warships on the Australian station.

ACCORDING to *Science*, an equatorial telescope has been given to the Nantucket Maria Mitchell Association, and plans of an observatory to house the instrument are being considered. An appeal has been made for funds properly to equip the observatory that it may be available for astronomy classes in the near future.

A MEMORANDUM, dated August 5, issued by the Director-General of the Egyptian Survey Department, states that the meteorological conditions of the monsoon season and the prospects of the Nile flood, is far from encouraging. The rains in June and July have been exceptionally weak, and some 16 per cent. of an average flood volume may be considered as deficient at the above date. On the whole, Captain Lyons thinks it more probable that this deficiency will be increased in August than that it will be diminished.

IN the *Meteorologische Zeitschrift* (part iv., 1907) Dr. V. Conrad gives an epitome of an interesting lecture delivered by him on the formation and constitution of the clouds. The author points out that to obtain a clear idea of the subject we require to know (1) the size of the separate fluid drops, (2) the rate of their descent, and (3) the number contained in a cubic centimetre. An idea of the pains bestowed upon the inquiry may be formed from the fact that sixty-nine references to authorities are quoted in the paper. The size appears to have been first microscopically measured by Kratzenstein, who published the results at Halle in 1746; recent measurements by Assmann, Dines, and others give their mean diameter as about 20 μ, or 10^{-3} cm. radius. The vesicular theory was not displaced until A. Waller published his paper in the Phil. Trans. in 1847, and subsequent investigators showed that the optical phenomena observed in clouds could only be explained by the existence of complete drops; much information upon this subject will be found in Dr. Pernter's "Meteorologische Optik." The researches of Stokes and others have shown that a droplet of 10^{-3} cm. radius would fall 1 cm. per second in calm air; with increasing radius, up to a certain limit, V increases with r^2, so that a drop of 10^{-2} cm. radius would attain a velocity of 1 metre per second. From independent investigations the author found the number of drops ($r=10^{-3}$ cm.) in a cubic metre of dense cloud to be 10^9 (a thousand millions), or 1000 in a cubic centimetre. The question of the formation of the first condensation elements is one of great difficulty, since it has been shown by Aitken and others that the presence of some nucleus in the atmosphere is necessary; possibly observations made in balloons may eventually elucidate the matter.

THE important position occupied by the electric spark in wireless telegraphy will account for the many attempts which have been made in recent years to obtain some knowledge as to its effective resistance. The principal methods used fall into two groups, based either on the original resonance arrangement of Bjerknes or on the substitution process of Simons. Unfortunately, the two groups give different results, and Dr. W. Eickhoff has rendered valuable service by his examination of the validity of the various methods which appears in the *Physikalische Zeitschrift* for August 1. He comes to the conclusion that deductions as to the most suitable arrangements for telegraphic purposes cannot legitimately be made from results obtained by the method of Simons.

THE memorandum of the Manchester Steam Users' Association for the year 1906 consists mainly of a report on the tests of pressure gauges carried out at the National Physical Laboratory and the remarks of the chief engineer of the association on these tests, and on pressure gauges in general. The ten gauges tested were all by trustworthy makers and of first-class workmanship, and the report of the tests states that, as regards freedom from friction and backlash, they leave little to be desired. Greater agreement between the records at different temperatures ought to be aimed at, and for gauges subject to vibration some form of balancing should be adopted. The whole report will be of great value to pressure-gauge makers, and may be taken as a typical illustration of the way in which improvements can be brought about by the cooperation of manufacturers and an institution like the National Physical Laboratory.

DR. C. NORDMANN, of the Paris Observatory, published several years ago in the *Annales de l'Observatoire de Nice*, vol. ix., a theory of the diurnal variation of terrestrial magnetism according to which the convection currents of the upper atmosphere, crossing the lines of magnetic force, generate electromotive forces which, in a region rendered conducting by solar radiation, produce electric currents and so affect the magnetic needle. In the March number of *Terrestrial Magnetism* he shows that the observations he made in Algiers during the total solar eclipse of August 30, 1905, confirm a deduction from his theory, namely, that during an eclipse the magnetic needle should tend to return from its normal position at the time of occurrence of the eclipse towards its mean position for the day.

PARTS i. and ii. (comprising 335 pp. and 18 plates) of vol. lxxxvi. of the *Zeitschrift für wissenschaftliche Zoologie* are occupied by an elaborate paper on the comparative developmental history of sexual individuals in the hydroid polyps. The author, Mr. A. Goette, of Strassburg, formulates some important conclusions with regard to this development, which are, however, too complex to be summarised within our limitations of space.

IN a paper on the navicular of the tarsus of man and monkeys, published in vol. xli., part iv., of the *Journal of Anatomy and Physiology*, Mr. T. Manners-Smith describes and illustrates the remarkable variations obtaining in that bone in the human subject. In some degree, at any rate, these variations appear to be connected with the degree of mobility of the foot, certain features being more constantly developed in this bone in the skeletons of ancient Egyptians than among modern Europeans. The occasional existence of a separate element in the tuberosity of the navicular is also noticed.

FROM the astounding feat accomplished by Prince Borghese in his wonderful journey in a motor-car from Pekin to Paris, many lessons may be drawn. The greatest, the *Engineer* of August 16 points out, is the wonderful adaptability of the power-driven vehicle. The distance traversed is estimated at 7000 or 8000 miles, and the time occupied was sixty-two days, the daily average being about 121 miles. When the time is taken off for pulling the car through loose sand and for extricating it from morasses, the speed seems almost incredible, considering that for half the journey there were practically no roads. Serious obstacles were encountered. Overwhelmed in a cyclonic sandstorm, dragged through rivers, precipitated from a weak bridge into a fast-running river below, immersed in bogs, the wood-work of the car on fire, and being nearly run into by a train on the Trans-Siberian Railway, were a few of the experiences of the intrepid traveller, any one of which would be sufficient to stop most people from continuing such a perilous journey.

ON August 17, 1807, Robert Fulton's steamer, the *Clermont*, ran her trial trip from New York to Clermont, and in order to commemorate the centenary of steam navigation, an interesting account is given in the *Engineer* of August 16 of the events that led up to this development. Illustrations are given of the paddle-wheel steamboat *Clermont* and of her machinery.

THE prospects of the Indian manganese ore industry are discussed by Mr. A. Ghose in the Journal of the Society of Arts (August 2). The demand for Indian manganese ore has grown with great rapidity. In 1905 the export to Great Britain amounted to 71,660 tons, whilst last year the total amounted to 490,612 tons, valued at 865,443*l*. India supplied most of the manganese ore used in the British furnaces, Brazil with 127,257 tons being second, and Russia following with 103,276 tons.

AN interesting account of the Museum of Traffic and Engineering at Berlin is to be found in the August number of the *Engineering Magazine*. The museum is located in the old Hamburg passenger railway station, which has, however, been thoroughly reconstructed for the purpose so far as its basement is concerned. The museum has three main departments, devoted to railway, naval, and civil engineering respectively. Explanatory notes are added to many of the exhibits, and in some instances a cross-section is given to illustrate the internal arrangement. Some of the models may be worked by visitors, and to these a special notification is attached. Models of plant of exceptional interest are to be demonstrated and explained from time to time by officials of the institution. In addition to models, the museum possesses many diagrams, photographs, statistical tables, a reading room, and library, all of which should make it of real service to engineers.

THE extension section of the Manchester Microscopical Society has sent us its new list of lectures arranged for delivery by members of the society during the coming winter in Yorkshire, Manchester and district. The work of lecturing and demonstrating is entirely voluntary and gratuitous on the part of the members, but a charge is made for the hire of slides, travelling, and out-of-pocket expenses. The purpose of the section is to bring scientific knowledge, in a popular form, before societies unable to pay large fees to professional lecturers, but in all cases where lectures are given before societies which are commercial undertakings, or are subsidised out of Govern-

ment or public grants, a fee is charged in addition to the out-of-pocket expenses. All fees paid for lectures are devoted to the working expenses of the section.

IN a paper by Mr. W. F. Allen on the subcutaneous vessels of the head in certain fishes, published in the Proceedings of the Washington Academy of Sciences (vol. ix., p. 79), we regret to observe that Lepidosteus, the well-known name of the bony pike, is changed to Lepisosteus. Even if the latter be the original rendering, the former is grammatically correct, and should be maintained. We have also received copies of two papers on Mendelism, one by Mr. C. B. Davenport and the other by Mr. O. F. Cook, published in the same series. Variation and correlation in the crayfish, by Messrs. Pearl and Clawson, and researches on North American Acrididæ, by Mr. A. P. Morse, form the subject of papers issued by the Carnegie Institution of Washington, of which copies have reached us.

ACCORDING to the report in the July number of the *Victorian Naturalist*, Mr. F. C. A. Bernard selected as the subject of his presidential address to the last annual meeting of the Field Naturalists' Club of Victoria the increased facilities for the study of natural history in Australasia since 1880. After a well-deserved compliment to the Linnean Society of New South Wales, which he believed to be the only organisation existing at that date in Australia devoted solely to promoting the interests of natural history, the president traced the origin and progress of the numerous bodies which now exist for the same purpose.

IN an illustrated pamphlet entitled "The Brent Valley Bird Sanctuary" (published, at the price of sixpence, by the local branch of the Selborne Society) Mr. W. M. Webb gives a picturesque account of an attempt to encourage and protect the bird-life of the district. A wood of some nineteen acres in extent has been secured and put in charge of a keeper, and it is satisfactory to learn that it has afforded nesting sites for twenty-seven species of birds.

AN addition to the fauna of the British Isles is recorded by Mr. J. W. Taylor (in the *Irish Naturalist* for August) in the shape of *Vitrina elongata*, a land mollusc inhabiting the mountains of many parts of the Continent. The Irish specimens were discovered in 1904 and 1905 near Collon, county Louth.

THE contents of vol. xl. of *Neue Denkschriften der allg. schweiz. Gesellschaft* (1906) include an article by Dr. Theodor Studer on additional remains of the ground-sloth, *Grypotherium listaei*, from the well-known cavern of Ultima Esperanza, S. Patagonia. Separate copies of this article were issued in 1905. The author confirms the opinion that this ground-sloth inhabited the cave contemporaneously with aboriginal man, by whom it appears to have been kept in a semi-domesticated state. These aborigines seem to have been identical with the ancient Patagonians. Grypotherium appears to have been a stouter-built animal than Mylodon, with the orbital region of the skull smaller. Stratigraphists will find much to interest them in an article in the same volume by Dr. E. Gerber, of Bonn, on the geology of the Alps to the eastward of Kienthal, embracing the district between that valley and Lunterbrunnen.

A BULLETIN (No. 4) from the Agricultural Research Institute, Pusa, indicates the preliminary arrangements in connection with a series of fruit experiments initiated under the direction of Mr. A. Howard. The planting, pruning, and manurial experiments are in the main similar to those at Woburn. In addition, weathering experiments are proposed, which consist in removing the soil from round the stems and laying bare the roots for a period after the close of the rains; the object is to check vegetative growth, especially before the flowering period. The largest plots are planted with citrus fruits, peaches, mangoes, litchis, and figs.

IN plant experiments to test Mendelian principles several apparently anomalous results have been obtained by crossing white-seeded strains with plants having coloured seeds. In papers published in *Science*, vol. xxv., Nos. 646 and 647, Dr. G. H. Shull refers to results obtained by crossing the flowers of white flageolet beans with those of black-, brown-, and yellow-seeded forms in which the hybrids showed purple and mottled characters. The author adopts the explanation offered by Cuénot that in such a case there are three characters, the pigment character P, the purple modification B, and the mottling M. The black beans show PB dominant, M recessive, the white beans show all three characters dominant. Therefore, instead of considering the *allelomorph* or distinguishing character as necessarily single, Dr. Shull holds the view that it may be compound.

SEVERAL important contributions to the study of the proteins of the wheat grain have been made from time to time by Dr. T. B. Osborne in conjunction with other collaborators. The results have been brought together in Publication No. 84 of the Carnegie Institution of Washington, in which is given a full account of the experimental work, as well as a brief review of the literature. It is found that *gliadin*, a protein soluble in 70 per cent. alcohol, and *glutenin*, which together constitute the substance *gluten* obtained by washing the dough, form nearly the whole of the proteins in the endosperm; in the embryo the proteins are much smaller in amount, and consist chiefly of globulin, an albumin termed *leucosin*, and a proteose.

AN article by Mr. H. A. Smith entitled "Saving the Forests" appears in the *National Geographic Magazine* for the present month, and deals with the work of the United States Forest Service, which has charge of Government resources valued at 1,500,000,000 dollars. The U.S. national forests contain more than 150,000,000 acres. In economic usefulness the forests increase in importance almost day by day, and they are fast becoming self-supporting. In the year ending June 30, 1904, the national forests yielded a total revenue of 60,000 dollars, while for the year 1906–7 the sum realised amounted to 1,600,000 dollars, and it is thought that by 1910 the receipts from this source will be equal to the appropriations for the forest service.

ON account of a remarkable discovery of reptilian footprints, the Higher Bebington sandstone quarry at Storeton, Cheshire, has been visited by many geologists during the past year. From time to time Cheirotherioid, Rhynchosauroid, and Chelonoid footprints have been found at this quarry, but since the present owner introduced a stone-channelling machine much more work is being done, and the slabs are got out with less breakage. The quarry, which is worked in the Keuper Sandstone, has a vertical face of 130 feet, and at two horizons half-way down the face occur two thin beds of marl on which the interesting footprints are found, and casts of them occur on the layer of sandstone immediately overlying the marl. Photo-

graphs, by Mr. G. J. Williams, of the face of the quarry and of some of the footprints are reproduced in the report of H.M. Inspector of Mines for the Liverpool district for 1906 (Cd. 3449, vii.).

THE *Journal of Hygiene* for July (vii., No. 4) contains a number of interesting articles. Among others, Castellani shows that human yaws is transmissible to monkeys, and that in the lesions, spleen, and glands the same spirochæte (*S. pertenuis*) is present as in man.

AN interesting account of the evolution of the steam turbine and a sketch of the career of its inventor—the Hon. C. A. Parsons, F.R.S.—by Mr. A. A. Campbell Swinton, appears in the current issue of the *World's Work*. Other articles of scientific interest in the number are "Lobster Farming," by Mr. F. A. Talbot, dealing mainly with the work carried on at Mill Cove, Wickford, Rhode Island, by Dr. A. D. Mead, and "Scientific Taxidermy," by Mr. H. J. Shepstone. The two last-named contributions are strikingly illustrated.

WE recently published a review of part i., vol. i., of "Research in China," dealing with descriptive topography and geology (NATURE, August 8), and have now to record the receipt of part ii. of the same volume of the work. The bulk of the section before us treats of petrography and zoology, and is the work of Mr. Eliot Blackwelder, but there is also a syllabary of Chinese sounds by Dr. Friedrich Hirth, professor of Chinese at Columbia University. The work is issued by the Carnegie Institution of Washington.

A SECOND edition of "Impianti Elettrici a Correnti alternate semplici, bifasi e trifasi" has recently been received from Mr. U. Hoepli, Milan. The book forms one of the very practical series of Manuali Hoepli, and will be of service to students and electrical engineers able to read Italian.

MESSRS. A. AND C. BLACK announce a book entitled "The Norwegian Fjords," which is to be written and illustrated by Mr. A. H. Cooper. The work will describe the home life, domestic industries, religion, superstition, and folk-lore of the peasants of Norway.

THE Patent Office has just published a subject list of works on military and naval arts, including marine engineering, in the library of the Patent Office.

OUR ASTRONOMICAL COLUMN.

DANIEL'S COMET, 1907*d*.—This comet is now at its maximum brightness, and with a clear sky and good horizon may be seen quite easily by the naked eye for some time before sunrise. Its naked-eye magnitude on August 12 was estimated to be equal to that of Æsculi, about 3·5.

The comet rises about 25° north of east, in London, at about 2 a.m., and on August 22 will be some 12° 11′ directly south of Pollux.

Two excellent photographs of this object were secured by M. Quenisset, at Juvisy, at 2 a.m. on July 19 and 20 respectively, and are reproduced in the August number of the *Bulletin de la Société astronomique de France*. On the former date the photograph showed five tail streamers, but on the latter seven were to be seen on the plate. The longest tail extended some 4° from the nucleus, representing at least some 12,000,000 kilometres (7,500,000 miles); on July 20 the diameter of the nucleus was about 4′, or 173,000 kilometres (about 108,000 miles).

SEARCH-EPHEMERIDES FOR COMETS 1894 IV. AND 1900 III.—No. 4195 of the *Astronomische Nachrichten* (p. 319, August 7) contains two sets of search-ephemerides, one by Prof. Seares for the De Vico-E. Swift comet (1894 IV.) discovered in 1894, but not seen on its return in 1901, the other by Herr Scharbe for Giacobini's comet, 1900 III.

The former was referred to in these columns on August 1, and the comet's brightness on August 25, according to the ephemerides, will be either 0·61 or 0·86, its brightness when its magnitude was 13·1 (November 21, 1894) being taken as unity.

Ten alternative ephemerides are given for comet 1900 III.

MARS.—In a telegram published in No. 4195 of the *Astronomische Nachrichten* (p. 323, August 7), Prof. Lowell announces that the Martian double canal Gihon has been photographed as double both by Mr. Lampland and himself.

In Bulletin No. 30 of the Lowell Observatory the same observer discusses the results of the observations of the North Polar Cap of Mars during the period March–June, 1907. It appears that the cap commenced quite suddenly and in an extensive manner just as it did in 1903 and 1905, and on practically the same date, the Martian August 22–23. Further, the first frost melted again on the succeeding days and was followed by another fall a little later, again as it did in 1903 and 1905.

This striking fact led Prof. Lowell to investigate mathematically the problem of the daily insolation upon a planet, and he shows that the Martian phenomenon is in accordance with his deductions.

Among other points he demonstrates the existence of an atmosphere sufficient to retard the general deposition of frost by some nineteen days. He also states that the arctic and antarctic regions of Mars are actually warmer in the Martian summer than are ours, although the mean temperature of the planet, 48° F., is some twelve degrees less than the mean temperature of the earth.

THE TOTAL ECLIPSE OF JANUARY, 1908.—From No. 114 (p. 167, vol. xix., June 10) of the Publications of the Astronomical Society of the Pacific we learn that arrangements have been made for an expedition from the Lick Observatory to observe the total solar eclipse of January 3, 1908.

Only two islands are crossed by the shadow-path, and of these the Lick expedition has selected Flint Island (long. 151° 48′ W., lat. 11° 26′ S.), which lies in the central Pacific Ocean some 390 miles north-west of Tahiti.

Under the existing conditions the eclipse will occur at 11h. 18m. (local mean time), with the sun 15° from the zenith. The duration of totality, according to the American ephemeris, will be 4m. 6s.

The expedition, the sending of which has been made possible by the generosity of Mr. William H. Crocker, will leave San Francisco on November 22, journeying thence to Tahiti, and will be conveyed from the latter island by a U.S. gunboat.

At the instigation of Prof. Campbell, Prof. Abbot, of the Smithsonian Institution, will accompany the Lick expedition in order to secure bolometric observations of the corona. The two expeditions will be independent scientifically, but will be united in the travelling and subsistence arrangements.

In the August number of the *Observatory* (p. 333, No. 386) it is tentatively suggested that it may be possible for some European astronomer, who could not otherwise see the eclipse, to obtain some assistance from the Lick expedition.

THE LEEDS ASTRONOMICAL SOCIETY.—The fourteenth annual Journal and Transactions of the Leeds Astronomical Society contains some interesting papers communicated by the members during 1906.

An observatory, in connection with the University and the city council, was opened on May 4, 1906, on Woodhouse Moor, and contains an 18¼-inch Newtonian reflector and a transit instrument. These instruments are to be used by members of the University staff, certain university students, teachers and selected students from the Education Committee's schools and by members of the astronomical societies.

Among the papers published in the Journal, one may mention a discussion of the existence of an intra-Mercurial planet, an illustrated description of the immense Jai Singh observatories located at Benares, Delhi, and Jaipur, and a lengthy discussion of Tennyson's astronomy.